

Appln No. 09/715,944
Amdt date May 11, 2006
Reply to Office action of January 11, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A hyperlinked annotation data reception system comprising:
a tuner receiving a broadcast signal encoded with a plurality of mask data packets and a plurality of object data packets, each mask data packet corresponding to a particular video frame of a video program and including graphics data associated with a plurality of video objects in the particular video frame, the mask data packet including an identifier to an object mapping table included in a particular one of the plurality of object data packets, the object mapping table including an entry associated with each of the plurality of video objects in the particular video frame, each entry in the object mapping table referencing information data structures included in one or more of the plurality of object data packets, the information data structures including information for the corresponding video object; including annotation data, the annotation data including graphics data for overlaying a graphics image on a video frame, the graphics image being associated with a video object;
~~a demodulator in communication with said tuner;~~
a video decoder extracting the mask data packets and object data packets from the broadcast signal ~~in communication with said demodulator;~~
~~a display device in communication with said demodulator;~~
a memory storing the extracted mask data packets and object data packets ~~annotation data;~~ and
a central processing unit in communication with said ~~demodulator and said memory,~~
wherein said memory stores a computer program for: ~~that determines, when executed by said central processing unit, whether the video object is visible in the video frame, and controls~~

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~~display of the associated graphics image on said display device responsive to a determination that the video object is visible in the video frame.~~

determining whether each of the plurality of video objects is visible in the particular video frame;

for each video object determined to be visible in the particular video frame, overlaying the graphics image on the corresponding video object;

receiving a user selection associated with one of the overlaid graphics images;

retrieving the identifier of the object mapping table from the mask data packet corresponding to the particular video frame responsive to the user selection;

retrieving the object mapping table based on the retrieved identifier;

locating the entry in the object mapping table for the video object associated with the user selection;

identifying the information data structures referenced in the located entry;

retrieving the information in the information data structures; and

displaying the retrieved information on the display device.

2. (Canceled)

3. (Currently Amended) The system of claim 1, wherein each mask data packet identifies ~~said graphics image is associated with mask information used by said computer program to identify~~ regions on said display device.

4. (Currently Amended) The system of claim 3, wherein each ~~[[said]]~~ mask data packet includes ~~information comprises~~ a mask time stamp.

5. (Currently Amended) The system of claim 4, wherein said mask time stamp is used by said computer program to display the corresponding graphics images ~~said mask information~~ in temporal relation to ~~[[a]]~~ the corresponding video frame.

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6. (Canceled)

7. (Currently Amended) The system of claim [[6]] 1, wherein each [[said]] object data packet includes ~~information comprises~~ an object time stamp.

8. (Currently Amended) The system of claim 7, wherein said object time stamp includes ~~comprises~~ an expiration time stamp that is employed by said computer program to delete the corresponding object data packet ~~said object information~~ after a specified time.

9. (Canceled)

10. (Currently Amended) The system of claim [[9]] 1 wherein a particular information data structure ~~said first set of annotation data~~ includes an annotation data field and a second identifier referencing a ~~second~~ set of annotation data.

11. (Currently Amended) The system of claim 10 wherein said annotation data field is a title data field and said second identifier references a string including a title of [[said]] a particular video object.

12. (Original) The system of claim 10 wherein said annotation data field is a menu field and said second identifier references a selector including a set of display identifiers and a corresponding set of action identifiers.

13. (Currently Amended) The system of claim 10 wherein ~~said first and second identifiers are never duplicated by the system.~~ each identifier in the hyperlinked annotation data system is globally unique.

14. (Currently Amended) The system of claim 10 wherein said second identifier is a variable value.

15. (Currently Amended) A method of using broadcast information comprising hyperlinked annotation data, comprising:

employing a receiver adapted to receive, decode, store and manipulate broadcast information, said receiver having a central processor unit and at least one memory device;

receiving the broadcast information by the receiver a broadcast signal encoded with a plurality of mask data packets and a plurality of object data packets, each mask data packet corresponding to a particular video frame of a video program and including graphics data associated with a plurality of video objects in the particular video frame, the mask data packet including an identifier to an object mapping table included in a particular one of the plurality of object data packets, the object mapping table including an entry associated with each of the plurality of video objects in the particular video frame, each entry in the object mapping table referencing information data structures included in one or more of the plurality of object data packets, the information data structures including information for the corresponding video object;

decoding by the receiver said broadcast information signal to recover the mask data packets and object data packets ~~graphics data for overlaying a graphics image on a video frame, the graphics image being associated with a video;~~

storing said mask data packets and object data packets ~~graphics data in a first data queue~~ in said at least one memory device;

~~determining whether the video object is visible in a video frame; and~~

~~overlaying the graphics image on the video frame responsive to a determination that the video object is visible in the video frame.~~

determining whether each of the plurality of video objects is visible in the particular video frame;

for each video object determined to be visible in the particular video frame, overlaying the graphics image on the corresponding video object;

receiving a user selection associated with one of the overlaid graphics images;

retrieving the identifier of the object mapping table from the mask data packet corresponding to the particular video frame responsive to the user selection;

retrieving the object mapping table based on the retrieved identifier;

locating the entry in the object mapping table for the video object associated with the user selection;

identifying the information data structures referenced in the located entry;

retrieving the information in the information data structures; and

displaying the retrieved information on the display device.

16. (Canceled)

17. (Previously Presented) The method of claim 15, wherein said decoding is performed by a first active thread performing operations on said first data queue, and said comparing is performed by a second active thread performing operations on said first data queue.

18. (Previously Presented) The method of claim 17, wherein each mask includes a mask time stamp, the method comprising:

comparing said mask time stamp with a time stamp of a displayed video frame; and

displaying said mask based on a relationship between said mask time stamp and said stamp of said displayed video, wherein the step of comparing said mask time stamp with a time stamp of a displayed video frame commences with a comparison of an earliest mask time stamp with a time stamp of a most recently displayed video frame.

19. (Canceled)

20. (Previously Presented) The method of claim 18, further comprising:
in the event that said mask time stamp corresponds to a frame not yet displayed:

- (a) decoding said associated graphics image into an image buffer;
- (b) checking said mask time stamp to see if said decoded graphics image is to be displayed immediately;
- (c) if said decoded graphics image is to be displayed immediately, displaying said decoded graphics image; and
- (d) if said decoded graphics image is to be displayed at a later time, sleeping for a time calculated to end at the time said decoded graphics image is to be displayed and immediately upon awakening displaying said decoded graphics image.

21. (Canceled)

22. (Canceled)

23. (Currently Amended) The method of claim 1, wherein the determination of whether each of the plurality of ~~[[that]]~~ the video objects is visible in the video frame is based on a visibility indicia included with the mask annotation data packet, ~~the visibility indicia indicative of whether the video object is visible in the video frame.~~

24. (Canceled)

25. (Currently Amended) The method of claim 17, wherein said first thread is capable of adjusting a behavior of mask ~~[[of]]~~ data and said second thread is capable of adjusting a behavior of object data.

26. (Canceled)

27. (New) The system of claim 1, wherein the broadcast signal is a digital signal.
28. (New) The system of claim 1, wherein the broadcast signal is an analog signal.
29. (New) A hyperlinked annotation data broadcast system comprising:
a video source providing a video program including a plurality of video frames;
a video encoder in communication with the video source, said video encoder encoding into a broadcast signal a plurality of mask data packets and a plurality of object data packets, each mask data packet corresponding to a particular video frame of the video program and including graphics data associated with a plurality of video objects in the particular video frame, the mask data including an identifier to an object mapping table included in a particular one of the plurality of object data packets, the object mapping table including an entry associated with each of the plurality of video objects in the particular video frame, each entry in the object mapping table referencing information data structures included in one or more of the plurality of object data packets, the information data structures including information for the corresponding video object; and
means for transmitting the broadcast signal to a receiver,
wherein the receiver is configured to:
determine whether each of the plurality of video objects is visible in the particular video frame;
for each video object determined to be visible in the particular video frame, overlay the graphics image on the corresponding video object;
receive a user selection associated with one of the overlaid graphics images;
retrieve the identifier of the object mapping table from the mask data packet corresponding to the particular video frame responsive to the user selection;
retrieve the object mapping table based on the retrieved identifier;
locate the entry in the object mapping table for the video object associated with the user selection;

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identify the information data structures referenced in the located entry;
retrieve the information in the information data structures; and
display the retrieved information on a display device.